Sockets and XTI POSIX Ada Bindings

Open Systems Project Engineering Conference (OSPEC)

FY 98 Status Review

29 April - 1 May 1998

Greg Bussiere
NUWC Newport
Craig Meyer
Lockheed Martin Tactical Defense Systems

LOCKHEED MARTIN

Outline

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI NUWC

- **Background**
- **Technical Details**
- **Contracting/Financial/Issues**
- **FY98 Recommendations**
- **Summary**

LOCKHEED MARTIN

Background

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI — NUWC

General Problem:

- Networked systems lack standardized Ada bindings to COTS interconnect interfaces

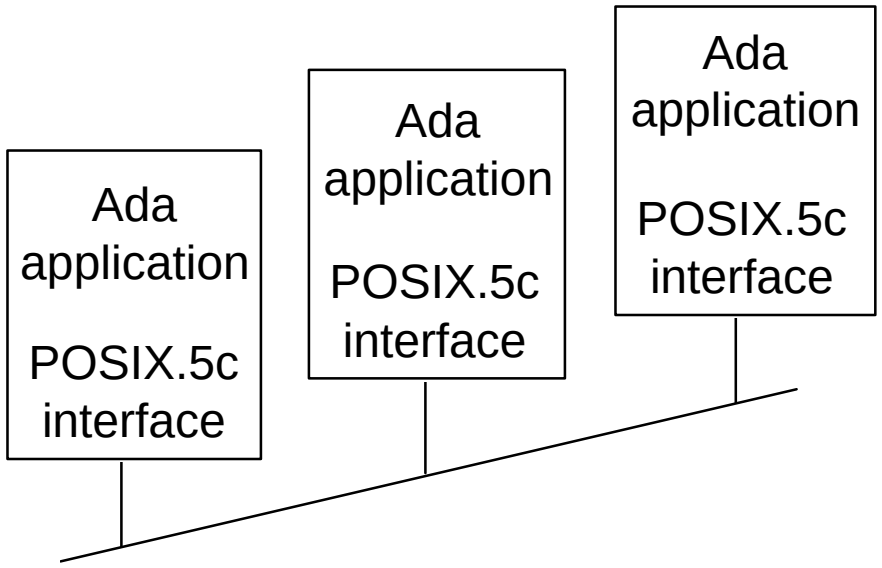
Solution:

Lockheed Martin in cooperation with government, as well as other interested parties, will:

- promote standardization of POSIX.5c Ada95 sockets and XTI bindings
- develop public-domain implementations of the Ada95 sockets and XTI bindings

Beneficiaries:

- Networked systems able to make use of COTS interconnect interfaces (e.g., NSSN, Aegis, AN/UYQ-70, AN/UYK-43 OSM)



LOCKHEED MARTIN

Project Overview

Open Systems Standardization

- IEEE POSIX.5c: Ada95 Bindings to POSIX.1g (sockets and XTI)

Open Systems Implementation

- IEEE POSIX.5c, Ada95 Bindings to POSIX.1g (sockets and XTI)
- Solaris & HP-UX platforms
- FSU GNAT Ada95 POSIX.5b bindings [Florist] (LM subcontract)
- Make available in public domain
- Two-year effort
- Lockheed Martin / NUWC-NP / Florida State University

LOCKHEED MARTIN

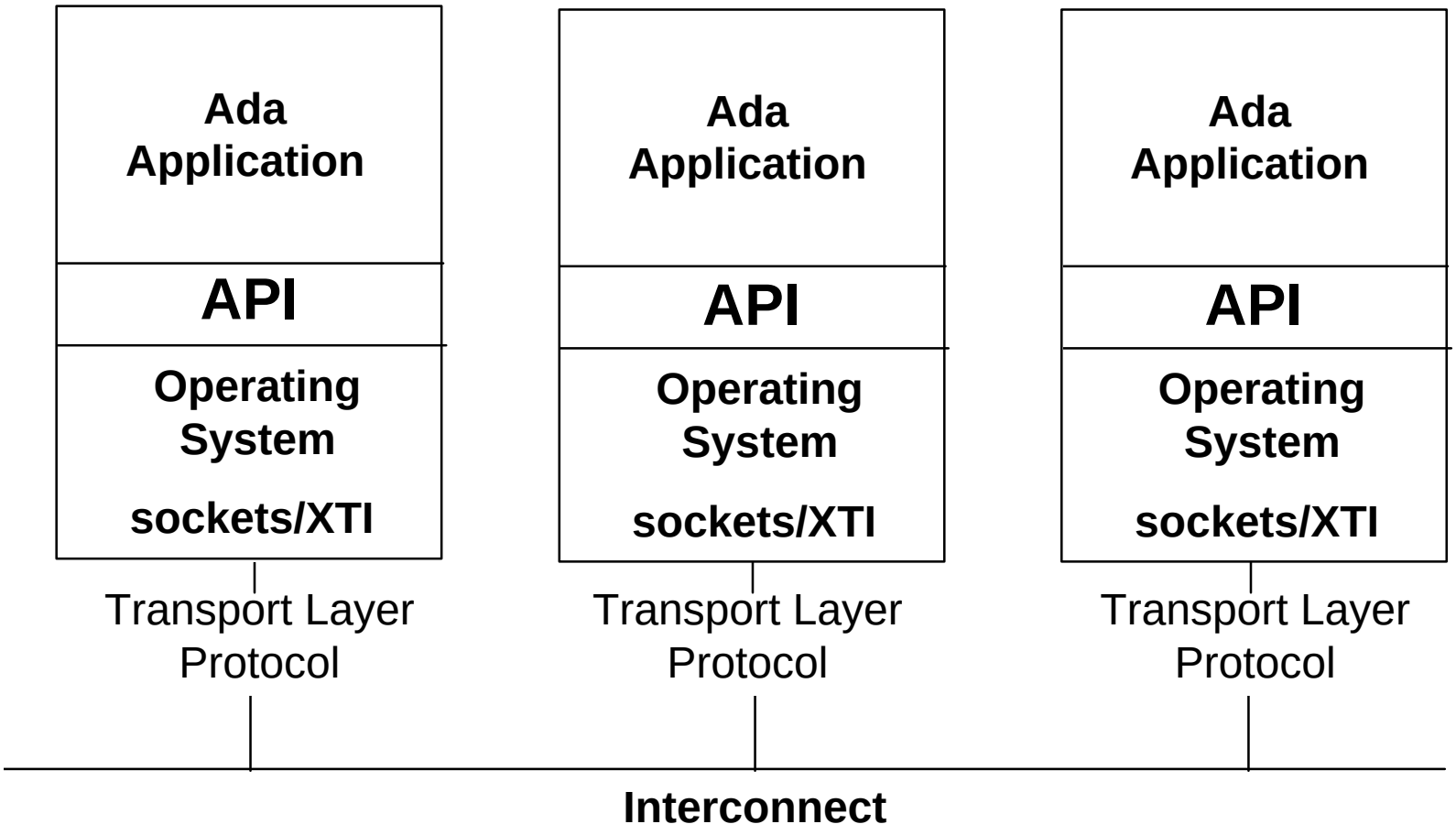
Outline

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI NUWC

- Background
- Technical Details
- Contracting/Financial/Issues
- FY98 Recommendations
- Summary

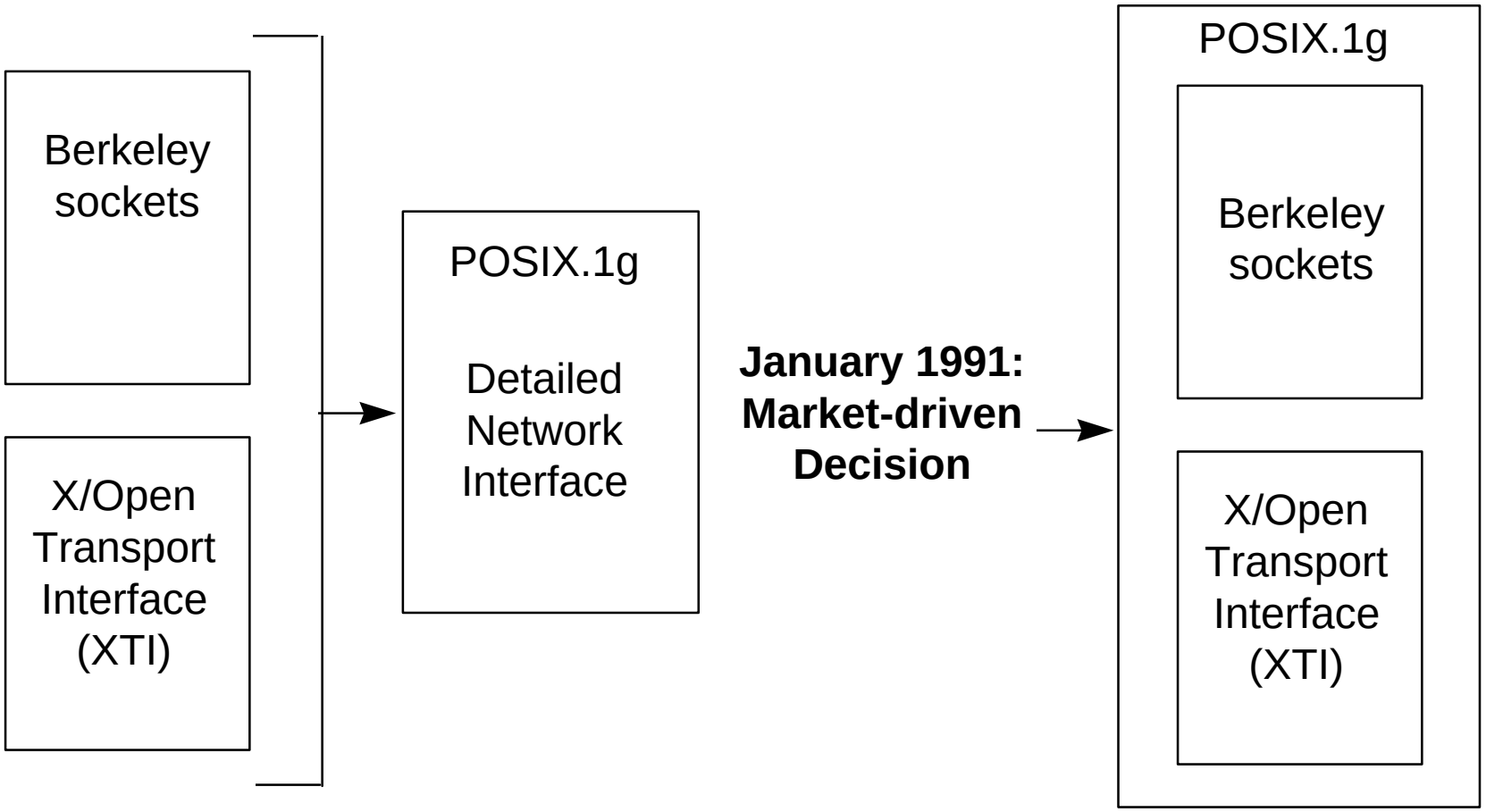
LOCKHEED MARTIN

The Work Site

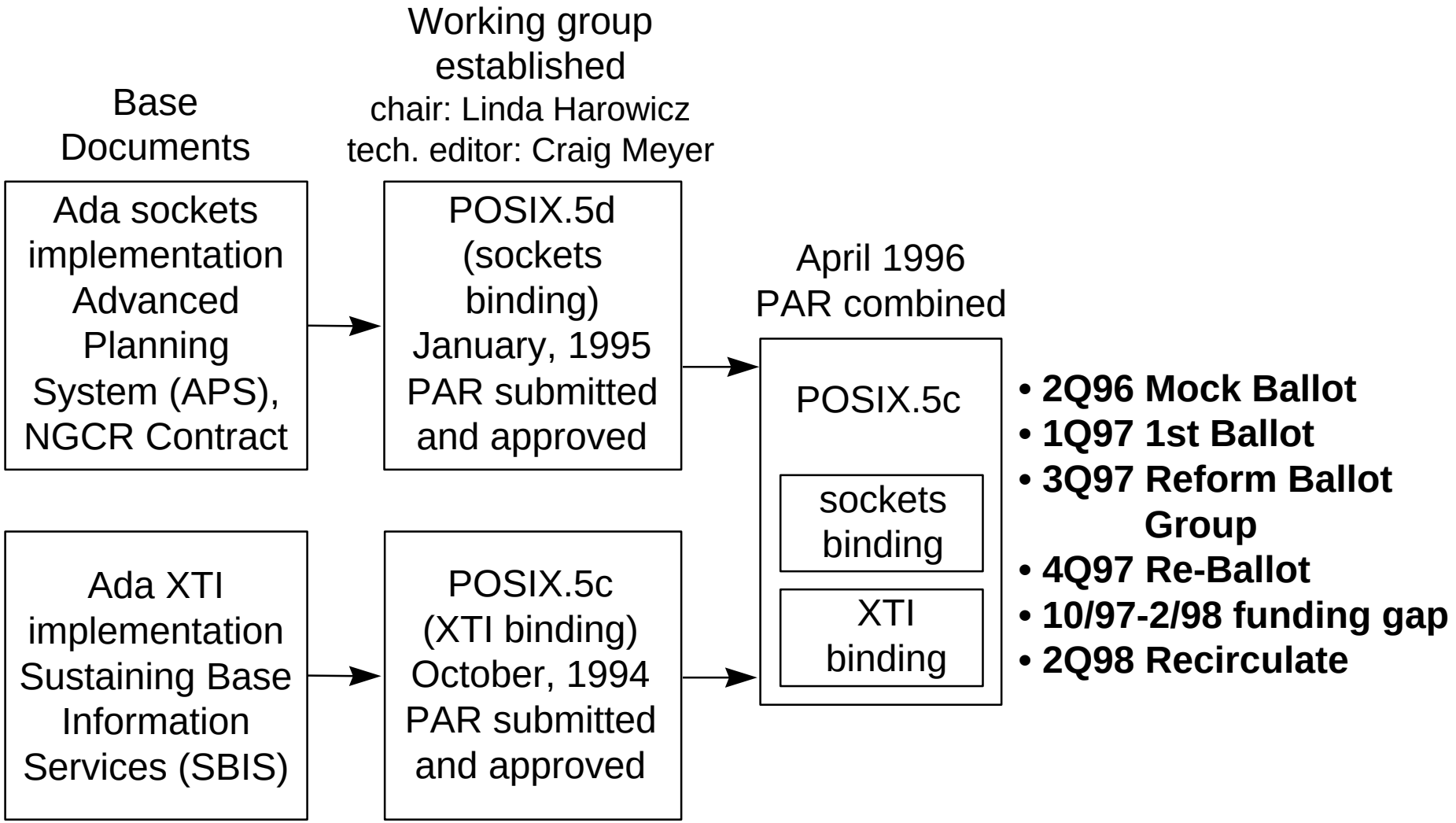


POSIX.1g Base

C language bindings



POSIX.5c Status



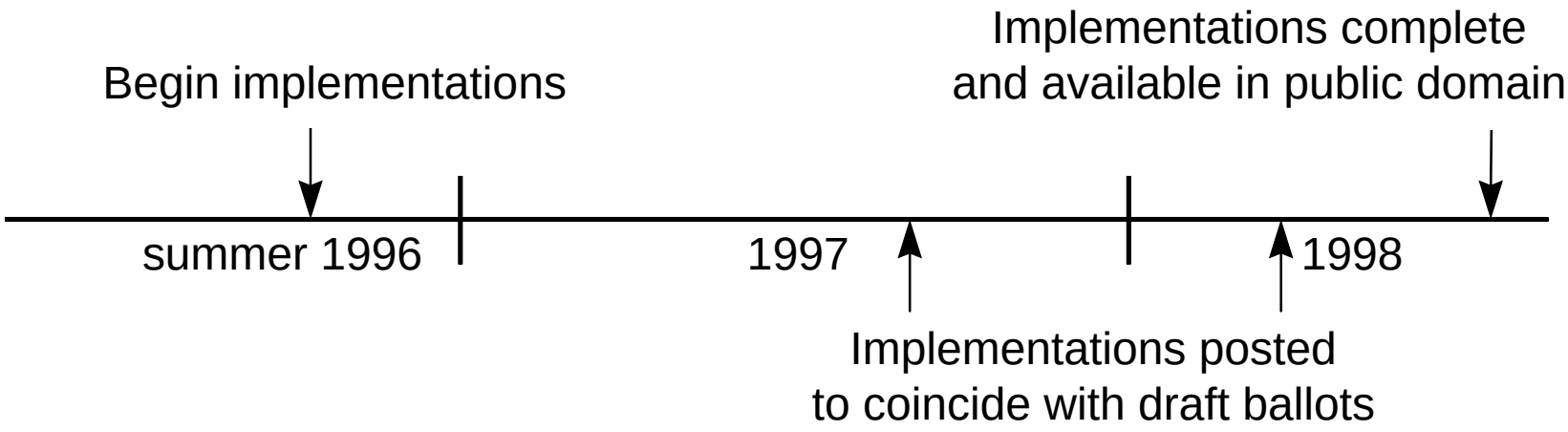
LOCKHEED MARTIN

Implementation Status

NAVAL UNDERSEA WARFARE CENTER NUWC DIVISION NEWPORT, RI

Ada95 sockets/XTI binding | GNAT Ada95 POSIX.5b binding

Solaris -or- HP-UX



LOCKHEED MARTIN

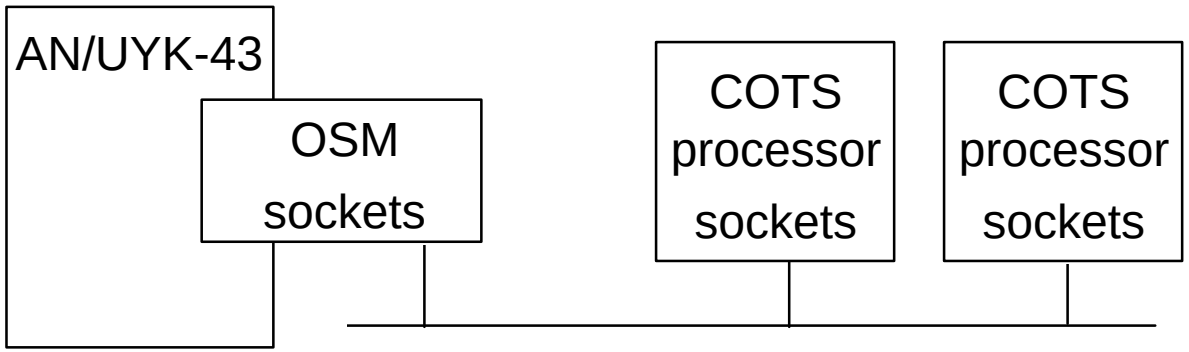
Uses of sockets/XTI

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI — NUWC

Potential Applications: Any networked systems
e.g., NSSN

Existing/Developing Applications:
SBIS (XTI)
BSY-2 (XTI)
APS (sockets)
Position Location and Reporting System (PLRS) (sockets)
AN/UYK-43 and AN/UYK-44 Open System Modules (OSM) (sockets)
AN/UYQ-70 for AEGIS (sockets)

Example:



LOCKHEED MARTIN

Demo Application

Scaleable Data Management System

NAVAL UNDERSEA WARFARE CENTER NUWC DIVISION NEWPORT, RI

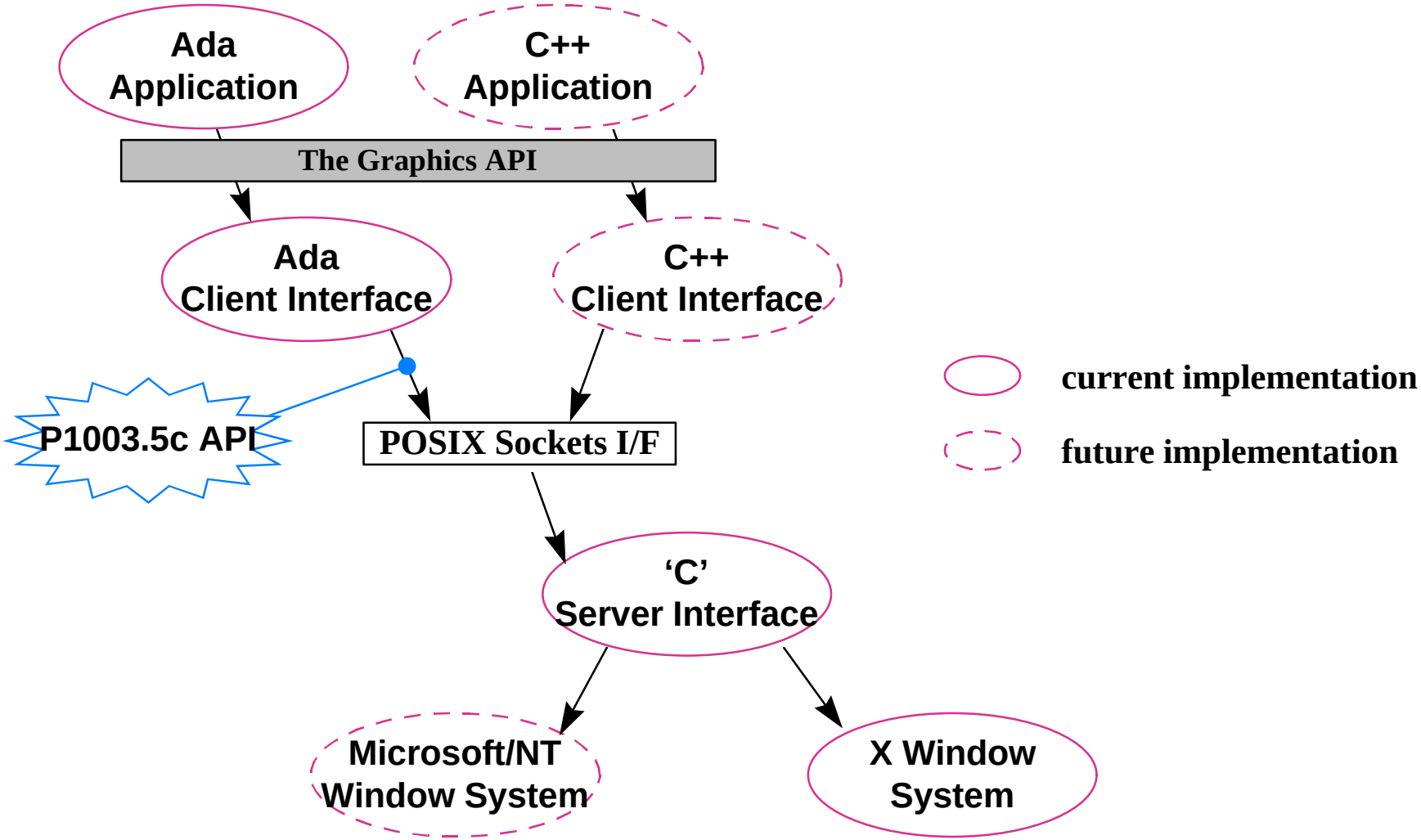
- **Developed a Maritime Surveillance architecture scaled for P-3C AIP and S-3B Ada P3I systems, and initially demonstrated the capability to link an Ada tactical graphics API to S-3B Ada legacy code via X Windows**

- **Lockheed Martin CY97 IR&D Program**
- **Used POSIX Sockets API to instrument the Client/Server interface**
- **Ada API will facilitate capture of legacy Mission Software into COTS environment**
- **Ada API will work in MIL hardware environment or pure COTS environment**

LOCKHEED MARTIN

Demo Application

Scaleable Data Management System



LOCKHEED MARTIN

Outline

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI NUWC

- Background
- Technical Details
- Contracting/Financial/Issues
- FY98 Recommendations
- Summary

LOCKHEED MARTIN

Contracts

NAVAL UNDERSEA WARFARE CENTER NUWC DIVISION NEWPORT, RI

Type of Contract:
- Firm Fixed Price Time & Material

Period of Performance:
- 10/95 - 10/98 (contract)
- 2/98 - 10/98 (task)

Status of Contract as of 5/1/98:
- Negotiated & signed

Task Return on Investment:
- Standards development
- Public domain implementations

Task Deliverables:
- POSIX.5c draft standard
- Sockets & XTI implementation

Contract and Contracting Officer:
- Contract # N00024-96-G-5207
- Allen Gram
  (612) 814-4157
  DCMC Twin Cities
  3001 Metro Drive
  Bloomington, MN 55425-1573

Task Value:
- $131K (LM) $50K (NUWC-NP)

Other Task Contributions:
- DISA - $210K ($60K - NGCR contract; $150K - AN/UYK-43 contract)
- OSJTF - $60K
- Lockheed Martin - XTI implementation
- NGCR - sockets implementation

LOCKHEED MARTIN

ISSUES

- OS/JTF Funding has enabled the working group to progress the POSIX.5c standard into the ballot stage
- Current funds will bring the standard near completion with a corresponding public domain implementation
- Future funding may be required to shepherd the draft through the IEEE and ISO standardization process
- Future efforts may also include interpretations and support for projects using the API

LOCKHEED MARTIN

Outline

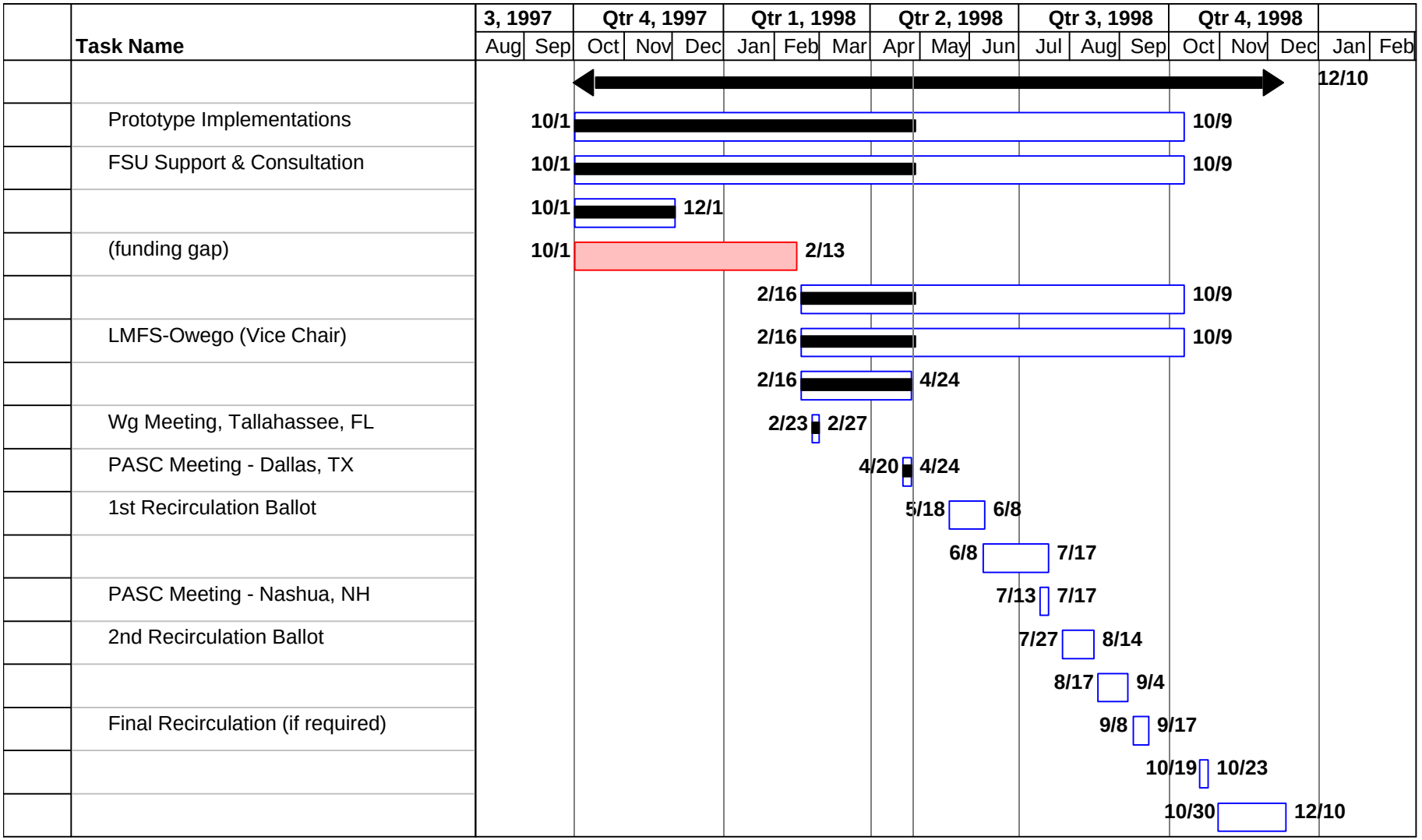
NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI NUWC

- Background
- Technical Details
- Contracting/Financial/Issues
- FY98 Recommendations
- Summary

LOCKHEED MARTIN

Project Schedule

NAVAL UNDERSEA WARFARE CENTER NUWC DIVISION NEWPORT, RI



LOCKHEED MARTIN

FY98 Recommendations

- **Continue support of POSIX.5c standardization**
  - **Chair: Linda Harowicz**
  - **Technical Editor: Craig Meyer**
  - **Distributed System and Ada expert: Greg Bussiere**
  - **Baseline Standard (POSIX.5b): Ted Baker**
- **Continue Development of POSIX.5c implementations in parallel with standardization work**
  - **to provide input to POSIX.5c standardization efforts**
  - **to have available public-domain implementations that track the draft**

LOCKHEED MARTIN

Outline

NAVAL UNDERSEA WARFARE CENTER DIVISION NEWPORT, RI NUWC

- Background
- Technical Details
- Contracting/Financial/Issues
- FY98 Recommendations
- Summary

LOCKHEED MARTIN

Summary

- The infrastructure to support the completion, use and enhancement of the standard is in place
- Lockheed Martin brings experience with both sockets and XTI Ada bindings as well as many years of POSIX and other open systems involvement.
- Government participants contribute additional experience with Ada, networking, POSIX, and open systems.
- Florida State University contributes expertise in Ada, GNAT, and the base POSIX.5b implementation and standard
- POSIX.5c standardization and implementations will make possible standard use of COTS network interfaces by Ada applications.